

## CLAIMS

1. Direct electrical drive (1) for a wheel set (30) of a vehicle, wherein the direct electrical drive (1) comprises a stator (7) and a rotor (3), with the rotor (3) being coupled mechanically with a wheel set shaft (11), characterized in that the rotor (3) has a cooling device.
2. Direct electrical drive (1) according to claim 1, characterized in that the wheel set shaft (11) is completely enveloped between wheels (31, 32) of the wheel set (30) by means of an electric machine (2) of the direct electrical drive (1).
3. Direct electrical drive (1) according to claim 1 or 2, characterized in that the cooling device has cooling channels (22), an air inlet (37) and at least one fan (9), whereby the cooling channels (22) extend inside the rotor (3).
4. Direct electrical drive (1) according to one of the claims 1 to 3, characterized in that the direct electrical drive (1) and/or the cooling device has at least one means (33, 35) for protection of the wheel set shaft (11).
5. Direct electrical drive (1) according to one of the claims 1 to 4, characterized in that the rotor (3) has at least one rotor hub (19) which is coupled mechanically to the wheel set shaft (11), with the rotor hub (19) being connected via at least one rotor web (21) with a support (14) for a rotor reaction part.
6. Direct electrical drive (1) according to one of the claims 4 to 5, characterized in that the means (33, 35) for protection of the wheel set shaft (11) is a catch device (35), with the catch device (35) being in particular a part of the fan (9) or a part of an air inlet (37).

7. Direct electrical drive (1) according to one of the claims 4 to 5, characterized in that the means (33, 35) for protection of the wheel set shaft (11) is a dirt guide device (33).
8. Direct electrical drive (1) according to one of the claims 3 to 7, characterized in that the air inlet (37) has a baffle wall (40).
9. Direct electrical drive (1) according to one of the claims 1 to 8, characterized in that the wheel set shaft (11) has a continuous jacket between wheels (31, 32) of the wheel set (30).
10. Direct electrical drive (1) according to one of the claims 1 to 9, characterized in that the direct electrical drive (1) has in the interior a dirt-binding surface, wherein the rotor or a cooling channel in particular has in the interior a dirt-binding surface.